

## REMARKS

Favorable reconsideration of this application is respectfully requested in view of the previous amendments and following remarks.

Claims 1-17 are pending. By this Amendment claims 1, 3, 4, 6, 8 and 13 are amended and new claim 17 is added. Support for the amendments can be found at least at the paragraph beginning at line 32 of page 7 of Applicants' as-filed specification. Support for new claim 17 can be found at least in Fig. 6 and the paragraph beginning at line 18 of page 12 of Applicants' as-filed specification.

The Office Action objects to the specification. The specification is amended to address the Examiner's concerns.

The Examiner rejects claims 1-5, 8, 10-12, 15 and 16 under 35 U.S. C. §103(a) over U.S. Patent No. 4,981,425 to Lierke et al. in view of U.S. Patent No. 5,164,198 to Bauckhage et al., DE 4328088 to Goldschmidt et al. and U.S. Patent No. 3,198,170 to Onishi; rejects claims 6, 7 and 13 under 35 U.S.C. §103(a) over Lierke, Bauckhage, Goldschmidt and Onishi and further in view of U.S. Patent No. 5,259,593 to Orme et al.; and rejects claim 9 and 14 under 35 U.S.C. §103(a) over Lierke, Bauckhage, Goldschmidt and Onishi and further in view of U.S. Patent No. 4,600,472 to Pitchon et al. These rejections are respectfully traversed.

Neither the Lierke patent, the Bauckhage patent, the Goldschmidt publication nor the Onishi patent disclose or suggest a paint feeding device by which paint can be fed into the vicinity of a maximum of the sound particle velocity of an ultrasonic field, wherein the paint feeding device has in the region of the standing ultrasonic field at least two pieces of pipe for discharging paint, and wherein at least two of the

pieces of pipe are arranged at one selected maximum of the sound particle velocity of the standing ultrasonic field, as in Applicants' independent claim 1.

Such features encompasses Applicants' exemplary embodiment as illustrated in Fig. 1, wherein pipes 30, 31, 32 are situated at one maximum of the sound particle velocity. As discussed in a non-limiting example in Applicants' specification at the paragraph beginning at line 32 of page 7, the free ends of the pieces of pipe 30, 31, and 32 are situated at only one maximum of the sound particle velocity. With this arrangement particularly high rates of paint, for example more than 200 ml/min are readily achievable. Moreover, it is ensured that the distribution of the diameters of the drops of atomized paint remain in the acceptable range.

The Bauckhage patent does not overcome the deficiencies of the Lierke patent. The Bauckhage patent relates to an apparatus for pulverizing a jet of liquid material, such as molten material. The Examiner cites the Bauckhage patent for teaching a plurality of crucibles 10 as shown in Figure 5. Three crucibles 10 are located parallel to oscillating axis 24 and the jets emerging therefrom are directed to the three nodal areas 28 and 29 of the ultrasonic field 27 to pulverize the liquid metal discharged from the crucibles 10. The Bauckhage patent does not disclose arranging the crucibles 10 in a region of one selected maximum of a sound particle velocity. Instead, in the Bauckhage patent the three crucibles are each located at three separate nodal areas.

The Examiner asserts that the Lierke and Bauckhage patents in combination, teach an arrangement for the placement of plural pipes in an ultrasonic field especially at a maximum. The Examiner also cites the Goldschmidt patent as teaching placing a feeding device having an outlet in the center of the ultrasonic

field. Applicants note however that this is not necessarily the maximum. Further, the Goldschmidt patent provides no teaching or suggestion of at least two pieces of pipe for discharging paint at one selected maximum of the sound particle velocity of a standing ultrasonic field. Regardless of whether the Lierke and Bauckhage patents and the Goldschmidt publication are considered individually or in the combination relied upon by the Examiner, they therefore fail to teach or suggest Applicants' claim 1 combination of features. As such claim 1 is allowable.

The Onishi patent does not overcome the deficiencies of the Lierke and Bauckhage patents and the Goldschmidt publication. In the Onishi patent, an ultrasonic wave vibrating element is fixed to a vibrating plate 5. Deflection of the vibrating plate 5 due to the density of the ultrasonic wave energy concentration in the vibrating plate 5 causes atomization of the paint supplied from the paint tank 9 and forces the paint particles to be projected onto the article 10.

The remaining dependent claims are allowable for at least the reasons discussed above as well as for the individual features they recite.

For example, Applicants' claim 4 recites that paint outlet openings of the at least two pieces of pipe at one selected maximum of the sound particle velocity of a standing ultrasonic wave are arranged on an imaginary straight line, wherein the straight line is perpendicular to an imaginary center line which passes through the centroids of opposing sound faces of the sonotrode and of the component. The crucibles 10 of Fig. 5 of the Bauckhage patent are arranged parallel to the oscillating axis 24. These features do not appear to be addressed by the Examiner.

New claim 17 recites wherein at least two pieces of pipe are arranged and another one selected maximum of the sound particle velocity of the standing ultrasonic field. This feature is not disclosed by any of the applied references.

Neither the Orme nor Pitchon patents provide the deficiencies of the Lierke, Bauckhage or Onishi patents and the Goldschmidt publication described above. As such, all pending claims are allowable.

Early and favorable action with respect to this application is respectfully requested.

Should the Examiner have any questions regarding this Amendment or the application in general, he is invited to contact the undersigned at the number provided below.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

Date: 7-23-04

By: 

Michael Britton  
Registration No. 47260

P.O. Box 1404  
Alexandria, VA 22313-1404  
703 836 6620